Rib-like prosthesis reconstruction after thoracectomy surgery does not impair chest wall elastance.

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Argomento: Anestesia cardiotoracica

BACKGROUND

Thoracectomy is the surgical treatment of cancer involving the chest wall. Surgical radicality may require wide resections and subsequent chest wall reconstruction (CWR), which may alter respiratory mechanics and influence the risk of complications. The ideal prosthesis should protect chest viscera without a significant increase in chest wall elastance (E_{CW}). A new technique developed at our Institute (so called rib-like prosthesis) seems to possess such characteristics.[1] We assessed E_{CW} variation to estimate the effect of rib-like CWR on respiratory function.

METHODS

This prospective observational study enrolled 8 patients (gender M/F:3/5, median age: 48 years) scheduled for thoracectomy. After anesthesia induction (baseline-T0) and at the end of surgery (postoperative-T1), airway pressure (P_{aw}), gas flow, esophageal pressure (P_{es}) and abdominal pressure (P_{ab}) were measured in supine position after an alveolar recruitment maneuver, using a sampling device for data recording and subsequent computer analysis. Static elastance of the respiratory system (E_{RS}), partitioned into lung (E_L) and chest wall (E_{CW}) components, was calculated as follows: $E_{RS} = \Delta P_{aw} / VT$, $E_{CW} = \Delta P_{es} /VT$, $E_L = E_{RS} – E_{CW}$. Finally, the relationship between E_{CW} variation and prosthesis extension was explored.

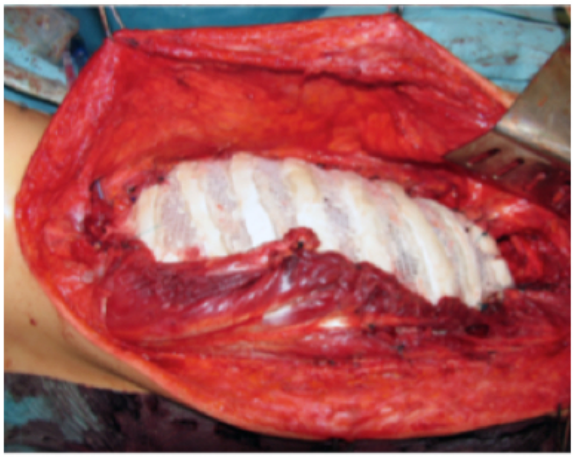
RESULTS

The following results are expressed as mean (95% CI), in cmH_2O/l: T0 E_{RS}=10.2 (6.8–13.5) vs. T1 E_{RS}=14.5 (9.7–19.3), P = 0.006; T0 E_L=7.3 (3.8 – 10.9) vs. T1 E_{RS}=10.5 (5.0–15.9), P = 0.021; T0 E_{CW}=2.8 (1.8–3.9) vs. T1 E_{CW}=4.0 (1.2–6.8), P = 0.274. CWR involved on average 15% (95%CI: 8.9-21-1%) of rib cage. Linear regression between E_{CW} variation and prosthesis extension was not significant (R^2 = 0.263; P = 0.239).

CONCLUSIONS

Results showed no significant difference between preoperative and postoperative E_{CW}, meaning that rib-like CWR does not alter chest wall mechanics by rendering the rib cage stiffer.

[1] Girotti P et al. Ann Thorac Surg 2011;92:1208-15



The rib-like prosthesis in place